

CASE REPORT

Spontaneous Rupture of the Abdominal Aorta Without Pre-existing Aneurysm – Two Case Reports

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Introduction

Rupture of an abdominal aortic aneurysm is a catastrophic event, with the risk of rupture being largely dependent upon the size of the aneurysm. Rupture may also occur in a non-aneurysmal aorta, generally as the result of one of a limited number of well defined causes, such as abdominal trauma,^{1,2} abdominal surgery,³ interventional radiology, or infection.^{4,5} We report two cases of patients with a rupture of a non-aneurysmal aorta, the first presenting as a false aneurysm, the second as a frank and severe retroperitoneal haemorrhage. In both cases, none of the above mentioned causes for spontaneous rupture were responsible.

Case One

A 56-year-old male presented with mild abdominal discomfort and a pulsatile abdominal swelling. There was a past history of myocardial infarction and hairy cell leukaemia, in total remission after chemotherapy. There was no history of abdominal trauma, interventional radiology or abdominal surgery. He was on anticoagulants and heart medication.

On examination he had a normal blood pressure and pulse. Abdominal examination revealed a slightly tender pulsatile mass to the right of the umbilicus, with a maximum diameter of 4 cm. All peripheral

arterial pulses were palpable. Ultrasonography confirmed an aneurysm of the distal aorta with a maximum diameter of 4.9 cm and without signs of retroperitoneal leakage. Arteriography showed a saccular aneurysm with a very narrow neck originating from the right side of the aorta just above its bifurcation.

At laparotomy the angiographic findings were confirmed and a hole approximately the size of a fingertip was identified on the right side of the aortic wall communicating with a false aneurysm. There was no penetrating atherosclerotic ulcer, just a hard plaque which appeared to have broken and caused the formation of a false aneurysm. The aorta and iliac arteries were of normal calibre. A Dacron tube graft was interposed.

The postoperative course was uneventful. All cultures proved negative for bacterial growth. Histological examination of the aneurysm wall showed a noninflammatory adventitia layer only, confirming the aneurysm to be false and without signs of infection.

Case Two

A 69-year-old lady was admitted after collapsing at home. She was in deep shock complaining of excruciating pain in the abdomen and back. She had a past history of a right-sided nephrectomy (lumbotomy incision) because of tuberculosis and a partial gastrectomy for peptic ulcer disease, both more than 10 years ago. There was no history of blunt or penetrating abdominal injury, interventional radiology or recent abdominal surgery.

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On examination of the abdomen, we found a large, ill-defined pulsatile mass. At immediate laparotomy a large retroperitoneal haematoma was found, originating from a longitudinal tear of about 2 cm on the left-hand side of the infrarenal aorta without any signs of dissection, aneurysmatic dilatation or penetrating atherosclerotic ulcer. A Dacron tube graft was interposed and the patient was transferred to the intensive care unit.

A second look laparotomy was performed the next day because of haemodynamic instability and a Hartmann's procedure was performed for ischaemia of the sigmoid colon. The postoperative course was stormy. On the seventh postoperative day the patient developed cardiac arrhythmia and hypotension. Resuscitation was unsuccessful.

Post-mortem examination showed multiple system organ failure as the cause of death. There were atherosclerotic plaques in the aorta, but no signs of dissection. Microscopically there was mucinous degeneration and extensive media sclerosis, but no signs of inflammation or bacterial invasion.

Discussion

The common view of aortic rupture is that it will only occur after the vessel has become sufficiently aneurysmatic: "... we see aneurysms before they rupture, but virtually never do we see non-aneurysmal vessels rupture spontaneously".⁶ Indeed, we are not aware of reports about rupture of a non-aneurysmal abdominal aorta without any specific cause; also, no relationship between chemotherapy and spontaneous rupture of the aorta could be found.

Penetrating atherosclerotic ulcers of the aorta is a clinical entity in which ulceration penetrates the aortic wall. It may lead to the formation of a true aneurysm.⁸ Pseudo-aneurysms, on the other hand, may occur due to a local weakening of a non-aneurysmatic aorta,

caused by trauma (blunt or penetrating),^{1,2} secondary to surgery³ or bacterial infection.^{4,5} Furthermore, they are a well known long-term complication of aorto-prosthetic anastomoses.⁷

In the two cases reported here, none of these factors have played a role in the spontaneous rupture. Therefore, although rarely spontaneous, rupture of the abdominal aorta appears to occur without the usual preceding aneurysmatic dilatation and without the precipitating factors known to be causative for pseudo-aneurysm formation. Histological and bacterial examination of both aortas showed only atherosclerotic changes in the first and cystic medial degeneration in the second, both known to be underlying factors for aneurysmal dilation.

In conclusion, these degenerative changes were probably responsible for the spontaneous ruptures in our patients, despite the lack of the usually preceding aneurysmal dilation.

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